C. Remarks

The claims are 1 and 11-14, with claim 1 being the sole independent claim. Claim 1 has been amended to clarify the invention. New claim 14 has been added. Support for the amendments can be found throughout the application as originally filed; see, e.g., paragraph [0128]. No new matter has been added. Reconsideration of the present claims is respectfully requested.

Claim 1 and 11-13 stand rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. In view of Applicants' amendment of claim 1 to address the Examiner's concerns, the §112 rejection is moot and should be withdrawn.

Claims 1 and 11-13 stand rejected under 35 U.S.C. §103(a) as being allegedly obvious over Watanabe (U.S. Patent No. 5,689,289) in view of Iwasaki (U.S. Patent No. 6,328,403) and Clark (U.S. Patent No. 7,265,856). Applicants respectfully traverse this rejection.

According to the present invention, a printing operation is performed by scanning a recording head which has ink of a plurality of colors. A print buffer is divided into a plurality of first regions corresponding with scan direction of the print head. Each first region is divided into a plurality of second regions corresponding with color. Input means sequentially inputs a plurality of block data corresponding to the first regions. The block data contains data corresponding to color and a color change code representing a color changing of data, and the data also contains compressed data. Acquisition means reads out block data from the input means and acquires data from the block data by decompressing the compressed data. Storage control means assigns block data to the first regions of the print buffer and stores the data acquired by the acquisition means in second

regions of the first regions and changes the second regions to storing on the basis of the color change code. The key features of the present invention are not disclosed or suggested by the cited combination of art, whether considered alone or in combination.

It is described in Watanabe in Fig.3 and at column 3, lines 47–63, that a facsimile apparatus comprises FAX unit 100 and printer unit 200, and FAX unit 100 has image buffer 104 and 4-line buffer 107. It is further described at column 4, lines 6-18, that printer unit 200 has reception buffer 202, printer buffer1 (205) and printer buffer2 (206). The reception buffer 202 temporarily stores data received by a centronics reception circuit 201. The printer buffers 205 and 206 store data output from the horizontal-to-vertical converter circuit 204. The printer buffers 205 and 206 have a data storage capacity corresponding to the area to be recorded by a single main scan of the recording head. Further, Watanabe describes at column 6, lines 41- 43, that each address of the printer buffers1 and 2 corresponds to a scanning position of the recording head. Further, it is described at column 7, lines 24- 42, that the printer buffer2(206) is used for data reading when the printer buffer1(205) is used for data storing, and the printer buffer1(205) is used for data reading when the printer buffer2(206) is used for data storing. These buffer controls are switched every time when the scanning operation has finished.

The structure of the printer buffer in Watanabe is therefore different from the present invention which requires that the print buffer is divided into a plurality of first regions corresponding with scan direction of the print head and that each first region is divided into a plurality of second regions corresponding with color.

Iwasaki describes with regard to Fig.13 at column 9, lines 14-18, that when the developing positions of print data of the individual colors are Kk, Cc, Mm, and Yy, following head driving data of the corresponding colors are acquired from the paper feed

side from the corresponding bands. Further, it is described in Fig.14 and at column 9, lines 58-60, that RAM has print buffers 618Y, 618M, 618C, and 618K and at column 10, lines 26-27, that the developed print data are stored in the print buffers 618. It is understood from Figs. 13 and 14 in Iwasaki that the print buffers are independent for each color.

Therefore, the structure of the print buffer in Iwasaki is different from that in the present invention wherein the print buffer is divided into a plurality of first regions corresponding with scan direction of the print head and wherein each first region is divided into a plurality of second regions corresponding with color.

Further, Iwasaki describes in Fig. 4 at column 4, line 10, to column 8, line 16, that a parameter x represents the main-scanning direction in which printing is performed, a parameter y represents the sub-scanning direction, Pxy represents each pixel, and Vxy represents the pixel density of the pixel Pxy. It is also described at column 6, lines 16-19, that Fig. 7 shows the layout of print elements in a print head of a color ink-jet printer apparatus of this embodiment and the positional relationship between the print elements and a printing medium. In Fig.7, the print element groups of the print head are arranged in the feed direction of the printing medium. Figs. 4 and 7 describe pixel position in a print medium but do not describe a buffer. In addition, Iwasaki describes in Fig. 11 at column 7, line 56, to column 8, line 16, that the printer apparatus 602 receives print codes transmitted from the host computer 601 and stores them in the reception buffer 615. The stored print codes are analyzed by the code analyzing means 616 as print data expressed by 2 bits per color. The analyzed print data of the individual colors are developed by the print data developing means 617, and the developed data are stored in the print buffers 618Y, 618M, 618C, and 618K of the corresponding colors under the control of the developing

band managing means 11004 to 11007. Each of these print buffers 618Y, 618M, 618C and 618K is configured in units of storage areas for eight rasters.

Iwasaki does not, however, disclose or suggest the color change code of the present invention. Furthermore, Iwasaki does not disclose or suggest the features of the present invention whereby the storage control means assigns block data to the first regions of the print buffer and stores the data acquired by the acquisition means in second regions of the first regions and changes the second regions to storing on the basis of the color change code.

Clark describes in Fig. 2, step 210, and at column 4, lines 18-26, that all the data for each color will be transmitted in a different data stream, and the host software 150 would divide the print data into a separate data stream for each of cyan, yellow, and magenta. Further, it is described at Fig. 3, and at column 5, lines 15-21, that the ordering of segments for three data streams, a cyan data stream 310, a magenta data stream 320, and yellow data stream 330, is performed. Clark also describes in Fig. 7, and at column 6, line 56, to column 7, line 2, that data stream 730 contains data 712, 713 and that segment 711 contains zeros for empty interval 714. Data 712 and data 713 are for the same color data.

In sum, Watanabe and Iwasaki fail to disclose or suggest a print buffer for being divided into a plurality of first regions corresponding with scan direction of the print head. Watanabe and Iwasaki likewise fail to disclose or suggest that each first region is divided into a plurality of second regions corresponding with color. Further, Watanabe and Iwasaki fail to disclose or suggest that storage control means assign block data to first regions of the print buffer and store the data acquired by the acquisition means in second regions of the first regions and change the second regions to storing on the basis of the color change code. What is more, Watanabe, Iwasaki, and Clark fail to disclose or suggest

that input means sequentially inputs a plurality of block data corresponding to a first region. The block data contains data corresponding to color and a color change code representing a color changing of data. For at least these reasons, the present invention is not obvious over the cited references. Withdrawal of the §103 rejection is respectfully requested.

In view of the foregoing amendment and remarks, favorable reconsideration and passage to issue is earnestly requested. Should the Examiner believe that issues remain outstanding, the Examiner is respectfully requested to contact Applicants' undersigned attorney in an effort to resolve such issues and advance the case to issue.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our below listed address.

Respectfully submitted,

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